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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,155	01/22/2004	Leonard Wai Fung Kho	07303.0102	8141

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EXAMINER	
PATEL, DHARTI HARIDAS	

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/764,155	KHO ET AL.	
	Examiner	Art Unit	
	Dharti H. Patel	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Kolmanovsky et al., Patent No. 6,693,787.

With respect to claim 1, Kolmanovsky teaches a system and method for controlling the impact or landing of an armature of the actuator against the pole face of an electromagnet of the armature. The apparatus comprising a first attracting member [Fig. 1, 16] opposing a second attracting member [Fig. 1, 18]; at least one target member [Fig. 1, 20] situated between the first attracting member and the second attracting member; at least one actuator [Fig. 1, 10] that moves at least one of the first attracting member, the second attracting member, and the target member, so as to adjust the distance between the target member and at least one of the first and second attracting members; at least one sensor [Fig. 1, 48] that detects a gap between the target member and at least one of the first and second attracting members; and a controller [Fig. 1, 46, 50] coupled to

the actuator [Fig. 1, 10] to adjust the size of the gap between the target member and at least one of the first and second attracting members [Col. 2, lines 59-61, Col. 3, lines 3-6, lines 64-67, Col. 4, lines 4-11]; wherein, during a coarse adjustment phase, the controller adjusts a gap size between the target member and an attracting member [the gap size is adjusted as the controller moves the target member 20 between the attracting members 16 and 18] that provides acceleration during the coarse adjustment phase [the target will necessarily go through a period of acceleration as the controller signals it to move from a stop position to a moving position], and the controller adjusts a gap size between the target member and an attracting member that provides deceleration [the target will necessarily go through a period of deceleration as the controller signals it to go from a moving position to a fully stopped position] during the coarse adjustment phase.

With respect to claim 12, Kolmanovsky teaches a first assembly including a target member [Fig. 1, 20]; a second assembly including a first attracting member [Fig. 1, 16] and a second attracting member [Fig. 1, 18] located on opposite sides of the target member; and an actuator [Fig. 1, 10] associated with the second assembly, wherein the actuator moves the second assembly to adjust the relative distance between the target member and the first attracting member [Col. 3, lines 3-8]; wherein, during a coarse adjustment phase, the actuator adjusts a gap size between the target member and an attracting member that provides acceleration during the coarse adjustment phase [the target will

necessarily go through a period of acceleration as the controller signals it to move from a stop position to a moving position], and the actuator adjust a gap size between the target member and an attracting member that provides deceleration [the target will necessarily go through a period of deceleration as the controller signals it to go from a moving position to a fully stopped position] during the coarse adjustment phase.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 2-5 and 13-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kolmanovsky et al., Patent No. 6,693,787, in view of Poon et al., Publication No. US2002/0185983.

With respect to claim 2, Kolmanovsky teaches a first attracting member, a second attracting member and a target member, but does not disclose that the apparatus further comprises a fine stage device that adjusts the position of a stage, wherein the target member is connected to the fine stage device.

Pool et al. teaches a method and apparatus for both coarsely and accurately controlling a scanning stage. Pool teaches a fine stage device [Fig. 1,

112] that adjusts the position of a stage, wherein the target member [Fig. 1, 116] is connected to the fine stage device [Page 5, Paragraph 5].

Both teachings are related by being means of positioning a movable target into an exact position. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Pool, which teaches a fine stage device, with the method of Kolmanovsky, for the benefit of fine-tuning the exact position of the target member.

With respect to claim 3, Kolmanovsky teaches that at least one of the first and second attracting members [Fig. 1, 16, 18] comprises a core member and a coil assembly [Fig. 1, 32, 34] that is disposed near the core member; and the controller [Fig. 1, 40, 46, 50] provides a current to the coil assembly [Fig. 1, 32, 34] to generate a force that accelerates the fine stage device [Col. 3, lines 11-21, Col. 4, lines 40-45, lines 52-54].

With respect to claim 4, Kolmanovsky teaches that at least one of the first and second attracting members [Fig. 1, 16, 18] comprises a core member and a coil assembly [Fig. 1, 32, 34] that is disposed near the core member; and the controller [Fig. 1, 40, 46, 50] provides a current to the coil assembly [Fig. 1, 32, 34] to generate a force that decelerates the fine stage device [Col. 3, lines 11-21, Col. 4, lines 40-45, lines 52-54.

With respect to claim 5, Kolmanovsky teaches that the actuator [Fig. 1, 10] provides acceleration or deceleration of the fine stage through a pair of members

formed by the target member [Fig. 1, 20] and one of the first and second attracting members [Fig. 1, 16, 18].

With respect to claim 13, Kolmanovsky teaches an apparatus that comprises opposing attracting members [Fig. 1, 16, 18], each capable of drawing an electric current, with a gap between the attracting member elements [Col. 3, lines 7-8, lines 16-19]; and a target member [Fig. 1, 20] in the gap; a sensor [Fig. 1, 48] configured to detect a position of the target member [Fig. 1, 20] so that the relative distance between the target member and the attracting members can be determined [Col. 3, lines 64-67] and a controller coupled to the coarse actuator [Fig. 1, 10] of the coarse stage assembly to control the position of the attracting members [Col. 4, lines 4-11]; wherein the controller is adapted to adjust gap size between the target member and one or more attracting members that provide an acceleration force [the target will necessarily go through a period of acceleration as the controller signals it to move from a stop position to a moving position], and/or a deceleration force [the target will necessarily go through a period of deceleration as the controller signals it to go from a moving position to a fully stopped position] to the target member during a coarse adjustment phase.

Poon teaches a dual force mode fine stage apparatus comprising a fine stage assembly [Fig. 1, 112]; a coarse stage assembly [Fig. 1, 108], the coarse stage assembly comprising a target member [Fig. 1, 116] in the gap, the target member being connected to the fine stage assembly [Fig. 1, 112], wherein the

coarse stage assembly is moveable along an axis independently of the fine stage through a coarse actuator [Page 4, paragraph 45, Page 1, paragraph 6].

Both teachings are related by being means of positioning a movable target into an exact position. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Pool, which teaches a fine stage device, with the method of Kolmanovsky, for the benefit of fine-tuning the exact position of the target member.

With respect to claim 14, Kolmanovsky teaches an apparatus that comprises a first attracting member [Fig. 1, 16] opposing a second attracting member [Fig. 1, 18]; at least one target member [Fig. 1, 20] situated between the first attracting member and the second attracting member, wherein the table is attached to at least one of the first attracting member, the second attracting member, and the target member; at least one actuator [Fig. 1, 10] that moves at least one of the first attracting member, the second attracting member, and the target member, so as to adjust the distance between the target member and at least one of the first and second attracting members; at least one sensor [Fig. 1, 48] that detects a gap between the target member and at least one of the first and second attracting members; and a controller [Fig. 1, 46, 50] coupled to the actuator to adjust the size of the gap between the target member and at least one of the first and second attracting members [Col. 2, lines 59-61, Col. 3, lines 3-6, lines 64-67, Col. 4, lines 4-11], wherein the controller is adapted to adjust gap size between the target member and one or more attracting members that

provide an acceleration force [the target will necessarily go through a period of acceleration as the controller signals it to move from a stop position to a moving position], and/or a deceleration force [the target will necessarily go through a period of deceleration as the controller signals it to go from a moving position to a fully stopped position] to the target member during a coarse adjustment phase.

Poon teaches a stage device that comprises a table [Fig. 7, 851] that retains an object [Fig. 7, 864].

Both teachings are related by being means of positioning a movable target into an exact position. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Pool, which teaches a table that retains an object in order to accurately position a reticle or reticle for exposure over a semiconductor wafer.

With respect to claims 15, 17 and 21, Kolmanovsky teaches an apparatus that comprises a first attracting member [Fig. 1, 16] opposing a second attracting member [Fig. 1, 18]; at least one target member [Fig. 1, 20] situated between the first attracting member and the second attracting member, wherein the table is attached to at least one of the first attracting member, the second attracting member, and the target member; at least one actuator [Fig. 1, 10] that moves at least one of the first attracting member, the second attracting member, and the target member, so as to adjust the distance between the target member and at least one of the first and second attracting members; at least one sensor [Fig. 1, 48] that detects a gap between the target member and at least one of the first

and second attracting members; and a controller [Fig. 1, 46, 50] coupled to the actuator to adjust the size of the gap between the target member and at least one of the first and second attracting members [Col. 2, lines 59-61, Col. 3, lines 3-6, lines 64-67, Col. 4, lines 4-11], wherein the controller is adapted to adjust gap size between the target member and one or more attracting members that provide an acceleration force [the target will necessarily go through a period of acceleration as the controller signals it to move from a stop position to a moving position], and/or a deceleration force [the target will necessarily go through a period of deceleration as the controller signals it to go from a moving position to a fully stopped position] to the target member during a coarse adjustment phase.

Poon teaches an exposure apparatus comprising an illumination system that irradiates radiant energy; and a stage device that carries an object disposed on a path of the radiant energy [Page 7, paragraph 78], wherein the stage device comprises a table [Fig. 7, 851] that retains an object [Fig. 7, 864].

Both teachings are related by being means of positioning a movable target into an exact position. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Poon, which teaches an exposure apparatus comprising an illumination system, with the method of Kolmanovsky in order to project a radiant energy, e. g., light, through a mask pattern on a reticle.

With respect to claims 16 and 18, Poon teaches that the object comprises a wafer or a reticle [Page 7, paragraph 76, lines 4-5, paragraph 78, lines 1-7].

With respect to claim 19, Kolmanovsky teaches an apparatus that comprises a first attracting member [Fig. 1, 16] opposing a second attracting member [Fig. 1, 18]; at least one target member [Fig. 1, 20] situated between the first attracting member and the second attracting member, wherein the table is attached to at least one of the first attracting member, the second attracting member, and the target member; at least one actuator [Fig. 1, 10] that moves at least one of the first attracting member, the second attracting member, and the target member, so as to adjust the distance between the target member and at least one of the first and second attracting members; at least one sensor [Fig. 1, 48] that detects a gap between the target member and at least one of the first and second attracting members; and a controller [Fig. 1, 46, 50] coupled to the actuator to adjust the size of the gap between the target member and at least one of the first and second attracting members [Col. 2, lines 59-61, Col. 3, lines 3-6, lines 64-67, Col. 4, lines 4-11], wherein the controller is adapted to adjust gap size between the target member and one or more attracting members that provide an acceleration force [the target will necessarily go through a period of acceleration as the controller signals it to move from a stop position to a moving position], and/or a deceleration force [the target will necessarily go through a period of deceleration as the controller signals it to go from a moving position to a fully stopped position] to the target member during a coarse adjustment phase.

Poon teaches a method for making a micro-device, the method comprising a photolithography process using a stage device to position an object, wherein

the stage device comprises a stable that retains the object [Page 7, paragraph 75].

Both teachings are related by being means of positioning a movable target into an exact position. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Poon, which teaches the method comprising a photolithography process, with the method of Kolmanovsky in order to expose the pattern from reticle onto wafer.

With respect to claims 20 and 22, Poon teaches that the object comprises a wafer or a reticle [Page 7, paragraph 76, lines 4-5, paragraph 78, lines 1-7].

With respect to claim 23, Poon teaches that the table comprises a wafer stage or a reticle stage [Page 7, paragraph 76, lines 4-5, paragraph 78, lines 1-7].

3. Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kolmanovsky et al., Patent No. 6,693,787, in view of Teng et al., Patent No. 6,472,777. With respect to claim 6, Kolmanovsky teaches an apparatus comprising a first attracting member, a second attracting member, at least one actuator, at least one sensor and a controller, but does not disclose a framework that connects the first attracting member and the second attracting member.

Teng et al. teaches a position sensor for a stage having opposed electro-magnetic actuators. Teng teaches a framework that connects the first attracting member and the second attracting members [Col. 2, lines 55-60].

Both teachings are related by being means of positioning a movable target into an exact position. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Teng, which teaches a framework that connects the first and the second attracting members, for the benefit of driving movement of the stage.

With respect to claim 7, Teng teaches that the actuator is connected to the framework [Col. 2, lines 45-47, lines 55-60].

With respect to claim 8, Teng teaches that moving the framework controls the gap [Col. 2, lines 55-60, E cores connected to the framework controls the gap].

With respect to claim 9, Teng teaches a method of moving a fine stage device [Fig. 1, 10], the method comprising connecting a fine stage device [Fig. 1, 10] to a coarse stage device [Col. 3, lines 9-12, lines 15-16], the coarse stage device comprising an attracting framework comprising opposing attracting members [Fig. 1, 14, 20, Col. 2,lines 55-60], and at least one target member [Fig. 1, 10], wherein the target member is located in a gap between the attracting members [Fig. 1, 14, 20] and connected to the fine stage device; and manipulating the relative position of the target member by moving the attracting framework to decrease the distance between one of the attracting members and the target member [Col. 3, lines 44-54]. It would have been obvious to use a pair of push-pull electro-magnetic actuators to move the stage back and forth along an axis for moving reticles and wafers in the semiconductor field. Kolmanovsky

teaches adjusting a gap size between the target member and at least one of the opposing attracting members that provides an acceleration [the target will necessarily go through a period of acceleration as the controller signals it to move from a stop position to a moving position] or deceleration [the target will necessarily go through a period of deceleration as the controller signals it to go from a moving position to a fully stopped position] force to the target member during a coarse stage adjustment phase.

With respect to claim 10, Kolmanovsky teaches that at least one of the attracting members comprises a core member and a coil assembly [Fig. 1, 32, 34] that is disposed near the core member, and the method further comprises providing a current to the coil assembly to cause acceleration movement of the fine stage device [Col. 3, lines 11-21, Col. 4, lines 40-45, lines 52-54].

With respect to claim 11, Kolmanovsky teaches that at least one of the attracting members comprises a core member and a coil assembly [Fig. 1, 32, 34] that is disposed near the core member, and the method further comprises providing a current to the coil assembly to cause deceleration movement of the fine stage device [Col. 3, lines 11-21, Col. 4, lines 40-45, lines 52-54].

Response to Arguments

4. Applicant's arguments filed on 07/10/2006 have been fully considered but they are not persuasive.

Applicant argues that the prior art references do not teach an apparatus capable of performing the claimed gap adjustment in connection with the recited adjustment phase.

The Kolmanovsky reference still reads on the claim language as shown above in claim 1. Kolmanovsky teaches that during a coarse adjustment phase, the controller adjusts a gap size between the target member and an attracting member [the gap size is adjusted as the controller moves the target member 20 between the attracting members 16 and 18] that provides acceleration during the coarse adjustment phase [the target will necessarily go through a period of acceleration as the controller signals it to move from a stop position to a moving position], and the controller adjusts a gap size between the target member and an attracting member that provides deceleration [the target will necessarily go through a period of deceleration as the controller signals it to go from a moving position to a fully stopped position] during the coarse adjustment phase.

Applicant's arguments are considered to have been successfully rebutted in view of the response to argument as given above. Accordingly,

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dharti H. Patel whose telephone number is 571-272-8659. The examiner can normally be reached on 8:30am - 5pm.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800, Ext. 36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DHP
09/26/2006

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